

What Is Claimed Is:

1. A single ply of a sheet molding composite sheet prior to compaction used for making composite parts having an improved surface characteristics comprising:

- an upper carrier film layer;
- a first resin paste layer;
- a plurality of chopped unfilamentized or partially filamentized fibers;
- a resin impregnated filamentized fiber layer;
- and
- a bottom carrier film layer.

2. The sheet molding composite sheet of claim 1, wherein said plurality of chopped unfilamentized or partially filamentized fibers form a resin impregnated unfilamentized or partially filamentized fiber layer when subsequently compacted.

3. The sheet molding composite sheet of claim 1, wherein the composition of the resin component of said first resin paste layer and said resin impregnated filamentized fiber layer comprises a polyester resin.

4. The sheet molding compound of claim 3, wherein said composition of said first resin paste layer and said resin impregnated filamentized fiber layer further comprises fillers, a resin inhibitor and

initiator, an alkaline earth oxide, and an internal mold release agent.

5. The sheet molding compound of claim 1, wherein the fiber composition of said resin impregnated filamentized fiber layer comprises filamentized E-type glass fibers.

6. The sheet molding compound of claim 1, wherein the fiber composition of said resin impregnated filamentized fiber layer further comprises filamentized conductive fibers.

7. The sheet molding compound of claim 1, wherein the fiber composition of said resin impregnated filamentized fiber layer further comprises conductive fibers.

8. A method for making a single ply of a sheet molding composite sheet comprising the steps of:

introducing a first carrier film layer;

introducing a first resin paste layer onto said first carrier film layer using a paste dispensing device, said first resin paste layer comprising a resin and a plurality of filamentized fibers;

introducing a layer of chopped filamentized or unfilamentized fibers onto the top surface of said first resin paste layer;

introducing a second resin paste layer onto said layer of chopped or unfilamentized fibers using a second paste dispensing device;

introducing a top carrier film layer onto said second resin paste layer to form a sheet molding composite sheet; and

compacting said sheet molding composite sheet to form a single ply of sheet molding compound.

9. The method of claim 8, wherein the step of introducing a first resin paste layer comprises the step of introducing a first resin paste layer onto said first carrier film layer using a paste dispensing device, said first resin paste layer comprising a resin and a plurality of filamentized fibers, wherein said plurality of filamentized fibers comprise between approximately 0.3 and 30% by weight of the formulation of said resin paste without fillers.

10. The method of claim 8, wherein the step of introducing a first resin paste layer comprises the step of introducing a first resin paste layer onto said first carrier film layer using a paste dispensing device, said first resin paste layer comprising a resin and a plurality of filamentized fibers, wherein said plurality of filamentized fibers comprise between approximately 0.3 and 30% by weight of said paste without fillers and is selected from the group consisting of filamentized glass fibers, filamentized carbon fibers, filamentized conductive fibers, and filamentized natural fibers.

11. The method of claim 8, wherein the step of introducing a first resin paste layer comprises the step of introducing a first resin paste layer onto said

first carrier film layer using a paste dispensing device, said first resin paste layer comprising a resin and a plurality of filamentized E-type glass fibers, wherein said plurality of filamentized E-type glass fibers comprise between approximately 0.3 and 30% by weight of the formulation of said paste without fillers.

12. The method of claim 8, wherein the step of introducing a layer of chopped filamentized or unfilamentized fibers onto the top surface of said first resin paste layer comprises the step of introducing a layer of chopped filamentized or unfilamentized fibers onto the top surface of said first resin paste layer, wherein said wherein said layer of filamentized or unfilamentized fibers comprise between approximately 0.25 and 60% by weight of the formulation of the sheet molding compound.

13. The method of claim 8, wherein the step of introducing a layer of chopped filamentized or unfilamentized fibers onto the top surface of said first resin paste layer comprises the step of introducing a layer of chopped filamentized or unfilamentized fibers onto the top surface of said first resin paste layer, wherein said wherein said layer of filamentized or unfilamentized fibers is selected from the group consisting of glass fibers, carbon fibers, and natural fibers.

14. The method of claim 8, wherein the step of compacting said sheet molding composite sheet to

form a single ply of sheet molding compound comprises the step of compacting said sheet molding composite sheet to form a single ply of sheet molding compound, wherein a portion of the resin contained in said first resin paste layer and said second resin paste layer penetrates said unfilamentized or partially filamentized fibers to form a discrete resin impregnated unfilamentized or partially filamentized fiber layer.

15. A method for making a composite part having improved surface characteristics comprising:

forming a single ply of a sheet molding composite sheet, the method of forming said single ply comprising the steps of:

- (a) introducing a first carrier film layer;
- (b) introducing a first resin paste layer onto said first carrier film layer using a paste dispensing device, said first resin paste layer comprising a resin paste and a plurality of filamentized fibers;
- (c) introducing a layer of chopped filamentized or unfilamentized fibers onto the top surface of said first resin paste layer;
- (d) introducing a second resin paste layer onto said layer of chopped or unfilamentized fibers using a second paste dispensing device;
- (e) introducing a top carrier film layer onto said second resin paste layer to form a sheet molding composite sheet;

(f) compacting said sheet molding composite sheet to form a single ply of sheet molding compound.

thickening said single ply;

cutting said single ply into a plurality of moldable plies having a desired shape;

introducing at least one of said plurality of moldable plies into a mold, wherein said first resin paste layer is closer to a visible surface than said second resin paste layer in a top ply of said at least one of said plurality of moldable plies; and

curing said at least one of said plurality of moldable plies at a first pressure and a first temperature for a sufficient time to form the composite part.

16. The method of claim 15, wherein the step of curing said at least one of said plurality of moldable plies comprises the step of curing said at least one of said plurality of moldable plies at about 140-163 degrees Celsius and between approximately 5-10 Mpa for between approximately one-half and three minutes.

17. The method of claim 15, wherein the step of (b) introducing a first resin paste layer comprises the step of (b) introducing a first resin paste layer onto said first carrier film layer using a paste dispensing device, said first resin paste layer comprising a resin and a plurality of filamentized fibers selected from the group consisting of a plurality of filamentized E-type glass fibers and a

plurality of conductive fibers, wherein said plurality of fibers comprise between approximately 0.3 and 30% by weight of said paste without fillers.

18. The method of claim 17, wherein the conductive fibers comprise one of filamentized fibers and partially filamentized fibers.

19. The method of claim 15, wherein the step of (c) introducing a layer of chopped filamentized or unfilamentized fibers onto the top surface of said first resin paste layer comprises the step of (c) introducing a layer of chopped filamentized or unfilamentized fibers onto the top surface of said first resin paste layer, wherein said wherein said layer of filamentized or unfilamentized fibers comprise between approximately 0.25 and 60% by weight of the formulation of the sheet molding compound.

20. The method of claim 15, wherein the step of (c) introducing a layer of chopped filamentized or unfilamentized fibers onto the top surface of said first resin paste layer comprises the step of (c) introducing a layer of chopped filamentized or unfilamentized fibers onto the top surface of said first resin paste layer, wherein said wherein said layer of filamentized or unfilamentized fibers is selected from the group consisting of glass fibers, carbon fibers, and natural fibers.

21. The method of claim 15 further comprising the step of introducing at least one ply of

a traditional sheet molding composite sheet on top of said at least one of said plurality of moldable plies within said mold, wherein an outer one of said at least one of said plurality of moldable plies is located along a visible surface of the composite part when molded.

22. The method of claim 15, wherein the step of (f) compacting said sheet molding composite sheet to form a single ply of sheet molding compound comprises the step of (f) compacting said sheet molding composite sheet to form a single ply of sheet molding compound, wherein a portion of the resin contained in said first resin paste layer and said second resin paste layer penetrates said unfilamentized or partially filamentized fibers to form a resin impregnated unfilamentized or partially filamentized fiber layer.

23. The method of claim 15, wherein the composite part is made from a single one of said plurality of moldable plies.

24. The method of claim 23, wherein the step of (b) introducing a first resin paste layer comprises the step of (b) introducing a first resin paste layer onto said first carrier film layer using a paste dispensing device, said first resin paste layer comprising a resin and a plurality of filamentized fibers selected from the group consisting of a plurality of filamentized E-type glass fibers and a plurality of conductive fibers, wherein said plurality of fibers comprise between approximately 0.3 and 30% by weight of said paste without fillers.

25. The method of claim 24, wherein the conductive fibers comprise one of filamentized conductive fibers and partially filamentized conductive fibers.